CLAIMS

What is claimed is:

1. A projection system to display an image on a screen, comprising:

first and second light sources, separated by a predetermined distance from each other and radiating a single white light in parallel and in the same direction;

first and second spiral lens discs comprising cylindrical lens cells arranged in a spiral shape and separating the single white light incident from the first and second light sources into a multi white light by converting a rotational motion of the cylindrical lens cells into a rectilinear movement of a cylindrical lens array;

first and second spectroscopes separating the multi white light incident from the first and second spiral lens discs into color light beams having different wavelength bands;

first and second light valves modulating the color light beams incident from the first and second spectroscopes according to an image signal to form the image; and

first and second projection lenses projecting the color light beams modulated by the first and second light valves onto the screen to display the image.

2. The projection system of claim 1, further comprising:

a first fly-eye lens on a first optical path between the first spectroscope and the first light valve; and

a second fly-eye lens on a second optical path between the second spectroscope and the second light valve.

3. The projection system of claim 2, further comprising:

a first relay lens on a third optical path between the first fly-eye lens and the first light valve; and

a second relay lens on a fourth optical path between the second fly-eye lens and the second light valve, wherein the first and second relay lenses focus the incident light onto the first and second light valves, respectively.

4. The projection system of claim 3, further comprising:

a first beam splitter disposed on a fifth optical path between the first relay lens and the first light valve, transmitting the light incident from the first relay lens to the first light valve, and reflecting the light incident from the first light valve to the first projection lens; and

a second beam splitter disposed on a sixth optical path between the second relay lens and the second light valve, transmitting the light incident from the second relay lens to the second light valve, and reflecting the light incident from the second light valve to the second projection lens.

5. The projection system of claim 1, wherein the first and second spectroscopes are dichroic filter arrays separating the incident light into the color light beams.

6. The projection system of claim 2, wherein the first and second spectroscopes are dichroic filter arrays, separating the incident light into the plurality of color light beams.

7. The projection system of claim 5, wherein at least one of the dichroic filter arrays comprises dichroic filters to separate the incident light into red, green, and blue light beams.

8. The projection system of claim 5, wherein at least one of the dichroic filter arrays comprises dichroic filters to separate the incident light into yellow, cyan, and magenta light beams.

9. The projection system of claim 7, wherein a color bar in which three colors comprise three segments, is formed on each of the first and second light valves.

10. The projection system of claim 8, wherein a color bar in which three colors comprise three segments, is formed on each of the first and second light valves.

11. A projection system to display an image on a screen, comprising:

first and second light sources separated by a predetermined distance from each other and radiating a single white light in parallel and in opposite directions facing each other;

first and second spiral lens discs comprising cylindrical lens cells arranged in a spiral shape and separating the single white light incident from the first and second light sources into a multi light by converting a rotational motion of the cylindrical lens cells into a rectilinear movement of a cylindrical lens array;

first and second spectroscopes separating the multi white light incident from the first and second spiral lens discs into color light beams having different wavelengths;

a light valve modulating the color light beams incident from the first and second spectroscopes according to an image signal to form the image; and

a projection lens, projecting the color light beams modulated by the light valve onto the screen to display the image.

12. The projection system of claim 11, further comprising:

a first fly-eye lens on a first optical path between the first spectroscope and the light valve; and

a second fly-eye lens on a second optical path between the second spectroscope and the light valve.

13. The projection system of claim 12, further comprising:

a first relay lens on a third optical path between the first fly-eye lens and the light valve; and

a second relay lens on a fourth optical path between the second fly-eye lens and the light valve, wherein the first and second relay lenses focus the incident light onto the light valve.

14. The projection system of claim 13, further comprising:

a first beam splitter disposed on a fifth optical path between the first relay lens and the light valve, transmitting the light incident from the first relay lens to the light valve, and reflecting the light incident from the light valve to the projection lens; and

a second beam splitter, disposed on a sixth optical path between the second relay lens and the light valve, transmitting the light incident from the second relay lens to the light valve, and reflecting the light incident from the light valve to the projection lens.

15. The projection system of claim 11, wherein the first and second spectroscopes are dichroic filter arrays, to separate the incident light into the color light beams.

16. The projection system of claim 12, wherein the first and second spectroscopes are dichroic filter arrays to separate the incident light into the color light beams.

17. The projection system of claim 13, wherein at least one of the dichroic filter arrays comprises a dichroic filter to separate the incident light into red, green, and blue light beams.

18. The projection system of claim 14, wherein at least one of the dichroic filter arrays comprises dichroic filters for separating the incident light into red, green, and blue light beams.

19. The projection system of claim 15, wherein at least one of the dichroic filter arrays comprising dichroic filters to separate the incident light into yellow, cyan, and magenta light beams.

20. The projection system of claim 16, wherein at least one of the dichroic filter arrays comprises dichroic filters to separate the incident light into yellow, cyan, and magenta light beams.

21. The projection system of claim 17, wherein a color bar in which three colors comprise three segments, is formed on the light valve.

22. The projection system of claim 18, wherein a color bar in which three colors comprise three segments, is formed on the light valve.

23. The projection system of claim 19, wherein a color bar in which three colors comprise three segments, is formed on the light valve.

24. The projection system of claim 20, wherein a color bar in which three colors comprise three segments, is formed on the light valve.

25. A projection system to display an image on a screen, comprising:

a light source radiating a single white light;

a spiral lens disc comprising cylindrical lens cells arranged in a spiral shape and separating the single white light incident from the light source into a multi light by converting a rotational motion of the cylindrical lens cells into a rectilinear movement of a cylindrical lens array;

a spectroscope separating the multi light incident from the spiral lens disc into color light beams having different wavelengths;

a color splitting filter splitting the color light beams incident from the spiral lens disc into two optical paths depending on the wavelengths;

first and second light valves modulating the color light beams, incident via two optical paths, according to an image signal to form the image; and

a projection lens projecting the color light beams modulated by the first and second light valves onto the screen to display the image.

26. The projection system of claim 25, further comprising:

a fly-eye lens on a first optical path between the spectroscope and the color splitting filter.

27. The projection system of claim 26, further comprising:

a relay lens on a second optical path between the fly-eye lens and the color splitting filter to focus the incident light onto the light valve.

28. The projection system of claim 25, wherein the spectroscope is a dichroic filter array to separate the incident light into the color light beams.

29. The projection system of claim 26, wherein the spectroscope is a dichroic filter array to separate the incident light into the color light beams.

30. The projection system of claim 28, wherein the dichroic filter array comprises dichroic filters to separate the incident light into yellow and violet light beams.

31. The projection system of claim 29, wherein the dichroic filter array comprises dichroic filters to separate the incident light into yellow and violet light beams.

32. The projection system of claim 25, wherein a color bar, in which one color is one segment, is formed on the first light valve, and a color bar, in which two colors are two segments, respectively, is formed on the second light valve.

33. A projection system to display an image on a screen, comprising:

a light source radiating a single white light;

a color splitting filter splitting the single white light incident from the light source into two optical paths depending on wavelength bands;

a spiral lens disc disposed on one of the two optical paths, and comprising cylindrical lens cells arranged in a spiral shape, and separating the light incident from the color splitting filter into a multi light by converting a rotational motion of the cylindrical lens cells into a rectilinear movement of a cylindrical lens array;

a spectroscope separating the multi light incident from the spiral lens disc into color light beams having different wavelengths;

first and second light valves modulating the light, incident via two optical paths, according to an image signal in order to form the image; and

a projection lens, projecting the color light beams modulated by the first and second light valves onto the screen to display the image.

34. The projection system of claim 33, further comprising:

a fly-eye lens on a first optical path between the spectroscope and the second light valve.

35. The projection system of claim 34, further comprising:

a relay lens on a second optical path between the color splitting filter and the light valve to focus the light on the light valve.

36. The projection system of claim 33, wherein the spectroscope is a dichroic filter array to separate the incident light into the color light beams.

37. The projection system of claim 35, wherein the spectroscope is a dichroic filter array to separate the incident light into the color light beams.

38. The projection system of claim 33, wherein the dichroic filter array comprises dichroic filters to separate the incident light into yellow and violet light beams.

39. The projection system of claim 33, wherein a color bar, in which one color is one segment, is formed on the first light valve, and a color bar, in which two colors are two segments, respectively, is formed on the second light valve.

40. The projection system of claim 33, wherein the spiral lens disc comprises the spiral shape using an involute function.

41. The projection system of claim 25, wherein the spiral lens disc comprises spiral curves where a plurality of normal lines are drawn with respect to an arbitrary tangent line of a central circle of the spiral lens at intervals of a same distance, and tangential vectors of the intersections between the tangent line and the normal lines are the same.

42. The projection system of claim 25, wherein as the spiral lens disc rotates at a predetermined speed, a lower lens cell and an upper lens cell of the spiral lens disc move up and down, respectively, at a predetermined speed.

43. The projection system of claim 43, wherein an optical path of light passing through the spiral lens disc continuously changes as the upper and lower lens cells of the spiral lens disc move, and a focused position on the light valve changes.

44. The projection system of claim 44, wherein the color bar is scrolled so that an order of the color bars RGB changes into GBR and then into BRG.